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Macroeconomic Adjustment and Growth

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Chile's Labor Markets in an Era of Adjustment

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A segmented labor market, an inadequate institutional framework for labor, and a distorted real exchange rate were at the root of persistent open unemployment in Chile. A better macroeconomic management and a more adequate regulatory framework for the labor market were critical to successful adjustment in the 1980s.

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Macroeconomic Adjustment and Growth

This paper — a product of the Macroeconomic Adjustment and Growth Division, Country Economics Department — is part of a larger effort in PRE to identify typical labor market policies in LDCs, specifically those affecting wage flexibility and labor mobility. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Raquel Luz, room N11-057, extension 34303 (41 pages with tables).

In the 1970s, Chile underwent profound structural changes in market regulation, public sector policies, and foreign trade.

These changes produced notable economic strain and high open unemployment. After the financial crisis of the 1980s — by means of an export-led structural adjustment program that supported high real exchange rates and promoted investment — the Chilean economy adjusted successfully and resumed economic growth.

Riveros describes the important role labor markets played in the adjustment process.

Expenditure-switching and expenditure-reduction policies are important in interpreting the observed performance of labor market variables. Riveros econometrically estimates an analytical model to study the impact of those policies on wages, unemployment, and investment. He concludes:

Segmentation of the Chilean labor market, combined with an inadequate institutional framework for the labor market and a distorted real exchange rate, have been at the root of the persistent open unemployment problem.

Because of existing labor market segmentation, macro policies have probably increased the wage gap between the formal and informal labor markets.

A more adequate regulatory framework for the labor market was probably instrumental in achieving a more equitable and effective adjustment program.

Produced at the PRE Dissemination Center

The research program of the Macroeconomic Adjustment and Growth Division (CECMG) is looking at how the structure of key markets affects the effectiveness of adjustment programs. In particular, the research program on labor markets aims at identifying typical labor market policies in LDCs, specifically those affecting wage flexibility, the labor mobility and key institutions. Along these lines, the Division is preparing several country studies that will be later on integrated in a set of common findings allowing to develop a comparative study. This paper is part of this research effort.

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I. INTRODUCTION

Like other LDCs, at the outset of the 1980s Chile faced persistent internal imbalances and an unsustainable external deficit. This was partly due to internal factors, especially the economic policy of the late 1970s which sustained a real revaluation, stimulated low savings, and allowed for growing indebtedness. However, the lending cutback of 1982 and both a sharp drop in terms of trade and increase in international interest rates were also crucial factors. The economy was unable to quickly generate a trade surplus in response to those external developments. After a deep recession, and due to export promotion and other policies dealing with the debt problem, the Chilean economy has resumed sustained growth.

The labor market attained a key role in the adjustment undergone by the Chilean economy. As predicted by the standard adjustment theory, a decline in real wages occurred as a result of expenditure-reducing and expenditure-switching policies. However, due to rigidities that hindered labor mobility, the economy suffered persistent high unemployment. Those rigidities were mainly associated with the presence of labor market segmentation. As a result of the post-1984 export-led adjustment program and a more deregulated labor market, open unemployment declined, employment in tradables increased notably and real wages started a recovery.

Without the profound structural economic reforms of the 1970s rapid achievement of growth and macroeconomic equilibrium after the financial crash of 1982-84 would have been nearly impossible. In fact, those reforms allowed for flexible and competitive markets, as required to achieve macroeconomic adjustment. Similarly, the precarious situation of labor market variables in the late 1970s is essential in understanding the effect of the 1980s' crisis.

In this paper we review stylized facts of the Chilean labor market during the period of structural reforms of the 1970s and that of crisis and recovery in the 1980s. To analyze the effect of macro policies --and given that existing wage differentials as well as the behavior of both unemployment and investment are central in interpreting the role of the labor market in the adjustment--we adopt a segmented labor market model in which we study the effect of exchange rate policies on those variables. We analyze the wage determination process in the formal and the informal sector through a statistical model that allows us to look at the effect of typical macro policies. A main implication is that, were labor markets less segmented, unemployment during the adjustment would have been lower. Given that segmentation is linked to labor market policies, less intervention would have been advisable.

The structure of the paper is as follows. In section two we discuss the economic scenario of the 1970s and 1980s, giving special attention to the economic reforms and adjustment policies that affected labor markets more importantly. In section three we analyze observed labor market outcomes in the 1970s and 1980s. In section four we attempt to interpret the observed labor market trends on the basis of a segmented labor markets model in which government intervention plays a crucial role. On the basis of that model, the role of exchange rate policies on the formal/informal wage gap is examined. In section five we include a summary and conclusions.

2. THE ECONOMIC SCENARIO

2.1 Overview

Achievement of deep economic reforms in the 1970s radically changed relative prices and reduced State intervention in the economy. A deregulation phase aimed at correcting major existing distortions took place in 1973-75. In a second phase (1975-76), heavier emphasis was put on price stabilization while also continuing with the structural reforms. Appreciating real exchange rates, high domestic interest rates and labor market friction created macroeconomic strain during 1976-80 and promoted higher growth of non-tradable production. During this third phase, the economy was characterized by growing real wages, high growth and high unemployment. The 1982-84 financial crisis conveyed a sharp economic decline amid serious balance-of-payment problems. Afterwards, due to sharp devaluations combined with expenditure reduction and other policies aimed at affecting expectations, increasing savings and promoting exports, the economy experienced a notable export-led economic expansion. This sequence of phases is paramount in explaining observed labor market outcomes.

2.2 The Economic Reforms of the 1970s

The post 1973 military government embarked upon an intense program of economic reforms aimed at improving efficiency in the framework of an open economy. Many observers have analyzed the specific targets and policy tools used in achieving those reforms.[1] However, the direct and indirect impact of the reform program on the labor market has received relatively less attention.

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[1] To this respect, see Edwards & Edwards (1987), Walton (1985) and Corbo (1983).

Major changes in labor market institutions were deemed necessary in the context of a freer, more de-regulated open economy. The presence of some intervening policies notwithstanding, those changes directly affected wages and employment. Deregulation of output markets, the opening of the economy and the reduction in the economic size of the state, indirectly affected employment and wages as a higher labor mobility was demanded by vital shifts in the skill composition of the labor demand. A more detailed description of the main reforms will subsequently facilitate the analysis of both effects.

2.2.1. Trade Reforms

Chile, like many other LDCs, pursued industrialization based on a sizable import substituting industry. High trade barriers, considerable inefficiency, discrimination against agriculture and growing government intervention in economic management were major outcomes of that policy (Corbo, 1987). Paradoxically enough, employment growth in manufacturing was negatively affected (Corbo & Meller, 1984), and labor market segmentation occurred due to increasing labor protection. Since the failure in achieving an efficient industrial sector required progressively higher protective barriers, average tariff rates reached as high as 105 percent by 1973 (Torres, 1982).[2]

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[2]. Ad-valorem tariff rates ranged from 0 to 750%, while import prohibitions applied to 187 tariff classification, a 90 day import deposit requirement was in effect for 2,800 others and 2,300 categories required special approval from the Central Bank.

The post-1973 reforms aimed at sharply reversing import-substitution through a far reaching opening up.[3] The trade opening was expected to produce more investment and employment in sectors with comparative advantages. The observed failure in obtaining higher exports and growth of labor-intensive industries in the 1970s is traced to two drawbacks: 1) the tariff reduction program did not start off with a very precise final target, thus creating uncertainty in investors (Rivaros,1986); 2) the exchange rate was used as a stabilization device, thus allowing for substantial overvaluation[4] (Corbo, 1985; Edwards & Edwards, 1987). However, amid high internal interest rates and growing peso appreciation, the economic authority decided to open the capital account; besides the macro imbalances so generated (Edwards & Edwards, 1987), this policy allowed large firms to adopt more capital-intensive techniques, thus also affecting employment in expanding activities.

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3. Tariff reduction was planned to reach an average 60% by 1977. By 1975 average tariffs had reached 57%, while almost all quantitative restrictions were eliminated . In a second stage, a new structure was defined, with tariffs ranging from 10 to 35%, a target achieved during the third quarter of 1977. Finally, a more radical reform allowed the average nominal tariff rate to reach an uniform 10% by late 1977.

4. After unification of the exchange rate in 1973, an initial 300% devaluation and a series of mini-devaluations, the real ex hange rate reached a peak value by late 1975. Subsequently, the real exchange rate declined sharply concluding in a 10% appreciation in june 1976. Real peso appreciation continued being used as a stabilization device through a system of devaluations that allowed for certain real appreciation. However, inflation did not drop as expected. From June 1979 a nominally fixed exchange rate was implemented and maintained until mid-1982, when dramatic peso devaluations took place in the wake of the world recession. In this analysis, appreciation is represented by a decline in the real exchange rate.

2.2.2 Public Sector Reforms

Another set of reforms after 1973 aimed at reducing the economic size of the State through both reduction of government expenditures and privatization of public firms. The huge fiscal deficit which existed in 1973 is an indicator of the economic importance the State had reached in Chile.[5] Another indicator is the share of parastatals in total production, which had been 14 percent of GDP in 1965 and reached 39 percent of GDP in 1973 (Hachette & Luders, 1987).

Still another indicator is the importance of the State as employer, especially during the socialist experiment of 1970-73, when public sector employment reached about 15 percent of total employment.[6]

Under the idea of subsidiary State, a profound privatization program was implemented, concurrently with policies aimed at achieving more efficient central government's services. Private firms intervened during the socialist government were immediately privatized after 1973: by the end of 1974, 202 out of 259 had been returned to their owners (Larrain, 1988). Additionally, a sale of assets owned by the State was quickly implemented, most of Banks' shares (US$ 171 million) and a significant part of industrial property (US$ 58 million) being sold by 1975.[7] Since parastatals' share in GDP dropped from 39

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[5]. In fact, as a proportion of the GDP, the fiscal deficit reached 10.7, 13.0, 24.7 and 10.5 respectively in 1971, 72, 73 and 74. As seen in Table 1, the decline experienced in 1975-76 was dramatic.

[6]. In 1970 about a 10% of the labor force was employed in the public sector (central government and parastatals), while in 1973 this proportion reached more than 13 percent. As seen in Table 3, this proportion declined to a 7% by 1980 and to about 5% in 1988.

[7]. This was a year of unprecedented economic decline (GDP fell by 12.9%), thus originating unprofitable sales. At the same time, firms were sold below their book values although above their stock market value [Larrain, 1987].

percent in 1973 to a still high 24 percent in 1981, further privatization took place at the time of the crisis of the 1980s. Owing to active job creation in the public sector in 1971-73, and existence of redundant employment, major job cuts in both the civil service and parastatals took place between 1973-75 (Table 3).

Table 1
Chile: Macroeconomic Indicators

	GDP Growth (1)	Output Growth (T) (2)	Output Growth (NT) (3)	CPI Infl. (4)	M1 Growth (5)	Gross Inv. (6)	Fiscal Def. (7)	C.Acc. Def. (8)	Change in Reser. (9)	Real Exch. Rate (10)
						-(Percent of GDP)--				
1970	2.1	1.4	2.9	32.5	60.2	16.4	2.7	-1.0	1.3	38.5
1975	-12.9	-16.6	-8.4	379.2	257.2	13.1	2.6	-6.8	-3.1	100.0
1976	3.5	5.3	1.6	234.5	189.4	12.8	2.3	1.5	2.4	91.5
1977	9.9	7.8	9.4	113.8	113.5	14.4	1.8	-4.1	1.2	83.5
1978	8.2	4.5	9.6	49.8	65.0	17.8	0.8	-7.1	5.1	101.6
1979	8.3	7.0	10.0	36.6	57.8	17.8	-1.7	-5.7	6.1	105.9
1980	7.8	5.5	10.0	35.1	64.0	21.0	-3.1	-7.1	6.4	94.0
1981	5.5	3.8	5.4	19.7	-3.8	22.7	-1.7	-14.5	-0.9	74.8
1982	-14.1	-11.2	-10.8	9.9	7.3	11.3	2.3	-9.5	-4.9	81.1
1983	-0.7	0.5	-6.1	27.3	27.7	9.8	3.8	-5.6	-2.8	98.1
1984	6.3	7.9	5.3	19.9	12.1	15.3	4.0	-10.7	0.2	100.8
1985	2.4	2.5	2.4	30.7	11.3	13.9	6.3	-8.3	-1.2	123.0
1986	5.7	6.7	5.0	19.5	41.4	15.0	2.8	-6.5	-0.5	139.9
1987	5.4	3.5	6.6	19.9	9.8	na	0.1	-4.6	0.5	143.5

Notes: T =Tradable; NT=Non-Tradable; Inv=Investment; C.Acc.=Current Account; Reser = net Reserves; Def=Deficit.

Tradables includes agriculture, fishing, mining and manufacturing. Non-tradables includes construction and services.

The Real effective exchange rate (10) is the real multilateral exchange rate in terms of the wholesale prices of trading partners and Chile's cpi.

Average Investment/GDP during 1960-69 was 14.9% of GDP.

M1 growth (5) is the December to December Growth of M1.

Sources: (1), (2). (3), (5), (6), and (7), Indicadores Economicos y Sociales, 1960-85, Banco Central de Chile, 1967.
(4), (6), (8) and (9), Corbo (1988); (10), Cottani (1987).

2.2.3 Markets Deregulation.

A top priority of the post-1973 reform program was the improvement of resource allocation through an efficient price system. Hence, and countering a historical tradition of price fixing, price regulation was almost completely eliminated at once.[8] Likewise, interest rates were also deregulated and quantitative constraints for capital market operations were eliminated before 1979. Increased market competition faced entrepreneurs with the need to improve productive efficiency.

The wave of deregulation also reached the labor market, thus yielding important effects after a period of acute government intervention and heavy union activism. Unions were de facto eliminated, their leaders being hand-picked by the government itself. Job security, which was a traditional rule in Chile, was also eliminated, while wage bargaining was suspended. Minimum wages and non-wage cost regulations were upheld and a wage indexation system was implemented, but with little effect [Edwards & Edwards (1987), Riveros (1986]. As discussed below, a major failure of the program was the lack of a labor law during 1973-79 -- and even of signals about projected legal changes -- thus creating expectations on high future firing and hiring costs.

2.2.4 The Stabilization Program

The initial phase of the structural reforms was accompanied by a sharp stabilization effort in 1975-76. A dramatic drop in fiscal deficit from 10.5

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8. After an era in which more than 3,000 prices were set and eventually controlled by the authority, only 33 commodities remained under control, most of them utilities.

to 2.6 percent of GDP was achieved in one year,[9] accompanied by a tighter monetary policy and, later on, by exchange rate appreciation. The unemployment effect of the across-the-board reduction in aggregate demand was important, as well as the drop in real wages. The stabilization effort also affected long run growth because of its effects on investment and wealth (Edwards, 1985).

2.3 The 1982 Financial Crisis and the Policy Response.

Some indicators reveal the magnitude of the crisis the Chilean economy faced in 1982. The total external debt increased from 2.7 times the total exports in 1979, to 4.6 times in 1983. As a share of GDP, the external debt increased from 40 percent to 100 percent in the same years, while yearly interest payments increased from 3 to 10 percent of GDP. At the same time, and due to an early policy reaction to the crisis, the value of imports in real terms declined by more than 40 percent (Table 2), which precipitated a GDP drop of more than 15 percent in GDP (Table 1). This GDP drop was accompanied by an even larger decline in aggregate investment, thus also affecting future growth. The magnitude of the external shock is seen in the drop in terms of trade (from 119 in 1979 to 88 in 1983), and the increase in real (LIBOR) interest rates from 2.6 to 4.6 percent.[10]

In 1984 a so called "adjustment- without-recession" approach, resulted in huge reserve losses and further external indebtedness. The current account

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9. The fiscal deficit (measured against GDP) declined from 24.7 to 10.5 between 1973 and 1974. A further drop to 2.6 was achieved in 1975. All this occurred basically through reduction in public sector expenditures.

10. See, Corbo & Sturzenegger (1988). Between 1978 and 1984 the real LIBOR increased from 1.1 to 6.1 percent.

deficit almost doubled between 1983 and 1984, while the fiscal deficit increased by more than 40 percent. Although unsustainable in the medium run, this approach resulted in a GDP growth of more than 6 percent in 1984, but also in declining exports and a large growth in external payments (table 2). After 1985, the adjustment program pursued the maintenance of a high real exchange rate, further privatization of public firms and control of fiscal expenditures, creation of mechanisms allowing to convert external debt into investment,[11] specific incentives for exports, and targeting fiscal social expenditures to the poor. As a result, the economy has resumed strong growth (more than 5.5 percent p.a. in 1986-88 and about 10 percent during 1989), with a large expansion of non-traditional exports, investment growth, low inflation and sharply declining open unemployment.

3. LABOR MARKET EFFECTS OF THE ADJUSTMENT PROGRAM

The economic reforms of the 1970s exerted major effects on the labor market. One of the most important was the increase in open unemployment rates from an average of about 6 percent of the labor force during the 1960s to one of more than 16 percent during 1974-81 (Table 3).[12] Moreover, even with high GDP growth in 1976 and 1981, open unemployment remained at relatively high levels (Table 3). A related result was the decline in average real wages, which started a recovery in 1976 in the presence of higher unemployment but not reaching their previous 1970 level (Table 4). In addition, during 1976-

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11. Which has yielded a drop of the total external debt in more than 10%.

12. This average includes persons in Emergency Employment Programs (EEP). As discussed below, this calculation yields an economically meaningful unemployment level. If EEP are not included, the average unemployment in 1974-81 reaches about 13% of the labor force.

Table 2
Chile: External Sector

	1979	1980	1981	1982	1983	1984	1985	1986	1987
1. External Debt									
(a) Total	8.49	11.8	15.5	17.1	17.4	18.9	19.3	19.4	19.1
(b) Interest	0.67	0.93	1.46	1.92	1.75	2.02	1.90	1.89	1.70
(c) Debt/Exports	2.7	2.4	4.1	4.6	4.6	5.2	5.1	4.6	3.7
(d) Debt/GNP	0.4	0.4	0.5	0.8	1.0	1.1	1.4	1.3	1.2
2. Exports(FOB)									
(a) Traditionals	2.16	2.62	2.18	2.12	2.34	1.96	2.12	2.10	2.60
(b) Non-Traditional	1.68	2.09	1.66	1.58	1.50	1.69	1.68	2.10	2.62
(c) Total	3.84	4.71	3.84	3.71	3.83	3.65	3.80	4.20	5.22
(d) Total(1980)	4.33	4.71	4.41	4.87	4.78	4.92	5.32	5.92	n.a.
3. Imports(CIF)									
(a) Consumer Goods	1.33	2.07	2.73	1.48	1.02	1.04	7.51	7.54	9.01
(b) Capital Goods	0.95	1.27	1.45	0.70	0.39	0.60	0.65	0.74	1.10
(c) Total Imports	4.71	6.15	7.32	4.09	3.17	3.74	3.27	3.44	4.40
(d) Total Imp.(1980)	5.81	6.19	6.25	4.25	3.36	4.04	3.59	3.65	n.a.
4. Terms of Trade (1980=100)	118.5	100	84.3	80.4	87.5	83.2	78.5	82.0	77.0

Note: 1987 is preliminary . Figures are expressed in billions of current US dollars. (1980) indicates that the series is expressed in constant 1980 billions of dollars.
Traditional exports include copper and mining.
Non-traditional exports are agricultural and industrial products.

Sources: (1),(2) and (3): Boletin Mensual, Banco Central de Chile.
2(d) and 3(d): World Tables (IBRD); (4): Corbo & Sturzenegger (1988).

81 employment in non tradable activities expanded more rapidly than in tradables, a result not concordant with the outward orientation of the economic program, but explainable in the context of the signals provided by an appreciating real exchange rate (Table 1). Finally, traditional labor market institutions --like wage bargaining, unionization and job security laws-- were not legally specified by until 1979, thus likely affecting expectations and countering employment creation in expanding tradable activities.

Table 3

Chile: Employment and Unemployment

	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1. Population (thousands of persons)																
(a) 12 years and over	6456.8	7339.1	7515.0	7691.5	7868.7	8057.1	8207.4	8369.7	8527.0	8681.9	8888.6	9096.0	9309.6	9502.7	9710.2	9922.2
(b) Total Labor Force	2932.2	3152.9	3218.4	3259.7	3370.1	3480.7	3539.8	3669.3	3729.5	3797.1	3937.1	4071.8	4160.3	4298.3	4455.0	4620.6
(c) Participation rate	45.4	43.0	42.8	42.4	42.8	43.2	43.1	43.8	43.7	43.7	44.3	44.8	44.7	45.1	45.9	46.6
2. Employment (thousands of persons)																
(a) Total Employment (UCH)	2708.1	2727.3	2705.0	2796.8	2891.5	3000.4	3122.1	3269.3	2971.5	3091.2	3185.1	3420.3	3582.0	3748.0	3911.5	4163.2
(b) Total Employment (INE)			2777.3	2820.5	2981.3	3003.3	3267.1	3270.9	2949.1	3215.8	3349.4	3537.4	3895.7	4010.8	4110.8	n.a.
(c) Emergency Employment Program		71.5	172.0	187.8	145.8	133.9	191.0	175.6	226.8	502.7	336.3	324.3	233.5	148.5	46.2	--
3. Unemployment (percent)																
(a) Castenada (UCH)	8.7	13.5	15.9	14.2	14.2	13.8	11.8	10.9	20.4	18.6	19.1	16.0	13.9	12.6	12.2	10.1
(b) Corrected (a)	8.7	16.5	20.6	19.2	18.0	17.2	16.5	15.1	25.7	30.1	22.9	20.9	18.0	15.2	13.1	10.1
(c) INE			12.7	11.8	14.2	13.8	10.4	11.3	19.6	14.8	13.9	12.0	8.8	7.9	6.3	
(d) Corrected (c)			17.4	16.9	17.9	17.0	15.0	15.5	25.0	26.2	21.4	19.0	13.6	10.9	7.2	
4. Sectoral Employment (thousands of persons)																
(a) Tradables	1208.0	1088.2	1017.1	1060.0	1058.1	1086.4	1113.3	1164.6	1037.1	993.5	1021.8	1035.9	1173.6	1273.9	1374.7	1491.6
Agriculture	825.8	534.6	488.9	517.4	514.7	512.1	518.3	548.9	531.9	510.1	532.7	561.0	570.9	605.2	647.3	657.6
(b) Non-tradables	1500.1	1575.0	1536.4	1571.4	1705.0	1799.1	1840.7	1950.2	1734.8	1555.2	1867.6	2060.1	2212.9	2343.4	2496.1	2671.8
(c) Public Sector Employment	280.0	325.5	314.3	295.9	293.3	315.7	258.9	281.3	230.5	357.6	356.2	381.6	360.6	349.1	302.7	n.a.
(d) Ratio of Tradable employment non-tradable employment	0.77	0.69	0.66	0.67	0.62	0.61	0.60	0.59	0.60	0.57	0.57	0.52	0.53	0.54	0.56	0.56

Sources: 1(a) 1970-88 from Castenada (1988), 1984-88 projected on the basis of UCH surveys.
1(b) 1970-88 from Castenada (1988), 1984-88 estimated with the growth rate (March-March) in UCH Surveys.
2(a) Indicadores Economicos y Sociales
3(a) Castenada's Figures using INE's unemployment rate corrected for rate of participation; 1984-88 based on UCH surveys
3(b) is 2(a) adjusted by employment emergency program during 1975-88
U-corrected = (+U)+(EEP+0.88)/(LF+(EEP+.05)
where LF : total labor force.
U : uncorrected unemployment rate
EEP: number of members
4(a) estimated based on Riveros (1984) and Indicadores Economicos y Sociales, 1980-85.
4(b) 1970-88 from Budnevich et.al. (1988), 1984-89 based on UCH surveys. Figures exclude 88 percent of EEF members (see text)
4(c) Paredes (1987).

3.1 Employment-Unemployment Trends in the 1970s

Explanations on the persistent high unemployment seen in the 1970s occupied a prominent place in the literature [see, for a review, Riveros (1985), Meller (1985)]. After a protracted debate, there is consensus in that alternative explanations have to be combined to provide a consistent theory on the unemployment figures shown in Table 3[13] [Edwards & Edwards, 1987].

A first explanation refers to a higher labor force growth seen in the 1970s relative to the 1960s. In fact, although participation rates did not increase and, on the contrary, slightly declined in 1974-80, labor supply growth was triggered by the post-WW-II "baby boom" (Castaneda, 1983). Some estimates showed that this supply effect may account for no more than 3 points of the higher open unemployment seen in the 1970s (Riveros, 1986).

A second explanation refers to the effect of policies regarding public sector and trade reforms. Figures on public sector employment (Table 3) show a dramatic decline after 1973, thus likely raising total unemployment in the short run. Between 1973 and 1978 public sector employment fell by almost 3 percent of the labor force,[14] while public sector's wage bill declined by about 3 percent of GDP in 1973-76 (Larrain, 1988). Moreover, elimination of job security amid increased competition in product markets gave rise to a

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13. Statistics presented in Table 3 adds to total observed unemployment those included in EEP but declaring themselves as "employed" to the surveys (see Riveros, 1986). The economic interest of this corrected series is that it allows to observe actual supply pressures on the labor market.

14. According to Paredes (1987), with data taken from Marshall & Romaguera (1979), public employment in 1973 reached about 388,000 persons. Cortes & Sjaastad (1982) suggested a more drastic decline between 1973-76: public employment declining by more than 6% of the labor force.

drastic reduction in redundant employment in the private sector.[15] Hence, the array of reforms of the 1970s would have transformed the hidden unemployment likely existing in the economy before 1973 into open unemployment. A third explanation refers to existence of labor market imperfections. In fact, the two explanations described above assume that wages did not play any significant role in accommodating a larger labor supply or a decline in labor demand. Although this is a likely short term outcome, a prolonged period of high unemployment may be ascribed to the presence of market imperfections. The basic hypothesis here is that the existence of protected/unprotected sectors in the labor market -- and possibly the expansion of the informal sector during the 1970s -- led to increased quasi-voluntary unemployment, associated with a queueing of informal sector workers for formal jobs. The observed evolution of wage differentials seems to provide support to this hypothesis (Riveros, 1986; Cox-Edwards, 1986). In addition, statistical analyses reveal that the role of certain labor market policies was an important source of queueing unemployment (Riveros & Paredes, 1989).

A fourth explanation refers to skill mismatches derived from the major productive shifts associated to the structural reforms, which would have produced significant shortages/surpluses of industry-specific skills. This is suggested by the presence of a growing tradable/non-tradable wage gap for both skilled and unskilled labor and by increasing returns to the general human capital in economic sectors undergoing expansion (Riveros, 1986). Prolonged friction was associated to wrong signals emanating from both the lack of labor laws and an appreciating real exchange rate, that did not allow expansion of

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15. Most entrepreneurs declared to a survey carried out through a World Bank study that one of the most beneficial reforms in connection with firms' adjustment was that referring to labor laws.

more labor intensive sectors like agriculture and export manufacturing, which are less intensive in specific skills then typical import substituting activities. The result was a stubborn persistence of wage differentials and lack of labor mobility toward expanding industries.

While employment in tradables did not expand significantly in 1976-81 (Table 3), employment in non-tradables was much more dynamic, growing at an average of 5.8 percent p.a..[16] This higher growth was mainly associated with construction activities, private services and the financial sector. As seen in Table 1, non-tradable production also expanded relatively more during the 1970s (at 7.7 percent p.a. in 1976-81, while tradables grew at only 5.7 percent p.a.), thus revealing a major problem with the signals provided by exchange rate policies and, lately, by the opening of the capital account.

3.2 The Performance of Real wages

The official (National Bureau of Statistics - INE) wage index shows a dramatic decline in real formal sector wages during the recessionary years of 1975-76, which followed the drop of 1973 due to a spiraling inflation (Table 4, col (2)). Figures obtained from University of Chile's surveys[17] (Table 4, col(6)) indicate a very similar trend, although a less dramatic decline, which is probably due to more stable labor earnings in informal activities. The earnings index based on skill categories (Table 4 cols (4) and (5)), indicates

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16. Employment in tradables grew at an average of only 1.3 percent p.a. and employment in agriculture at 0.8 percent p.a.

17. These surveys cover the Greater Santiago area and collect information on labor incomes once a year, covering both the formal and the informal sector. Yanez (1987) constructed sectoral wages based upon this information. The INE series is based in firm-based surveys, thus being more representative of formal sector activities.

Table 4
Chile: Real Wages
(Index: 1980=100)

	INE			University of Chile				Total
	Minimum Wage (1)	Average Wage (2)	Manuf. Wage (3)	Unskilled Wage (4)	Skilled Wage (5)	Average (6)	Manuf. (7)	Labor Cost (8)
1970	73.5	109.7	97.1	124.1	144.0	110.0	103.9	0.69
1975	91.9	62.5	58.3	77.3	66.7	62.8	72.0	0.43
1976	92,9	78.9	78.6	77.0	77.7	71.5	80.4	0.60
1977	83.0	79.9	78.6	80.3	89.5	81.3	84.9	0.88
1978	100.0	85.0	87.4	82.4	97.6	91.0	101.7	1.06
1979	97.1	92.0	94.2	102.6	103.3	99.6	108.1	1.28
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1.45
1981	113.2	108.8	115.5	120.4	117.7	114.4	131.5	2.42
1982	123.5	108.6	110.7	126.6	133.3	133.2	146.7	2.08
1983	93.4	97.0	102.9	80.9	95.2	95.1	111.5	1.30
1984	82.3	97.1	99.0	77.8	89.8	89.4	101.3	1.13
1985	74.3	93.0	97.1	75.6	74.4	75.5	85.1	0.77
1986	78.8	95.0	101.9	64.4	66.6	72.6	78.7	0.78
1987	66.9	93.1	103.2	63.1	65.2	71.4	77.1	0.81

Note: (8) is expressed nominal dollars per hour.

Sources: (1): National Bureau of Statistics (INE);two legal minimums existed in 1970: for white and blue collar workers. The latter is used here.
(2)-(3): INE; Average for each year.
(4)-(5): Paredes (1987) ;May of each year. Unskilled wages are a proxy for informal sector wages and correspond to an average for sel-employed workers with less than 8 years of schooling. Skilled wages are a proxy for formal sector wages and correspond to an average for blue and white collar workers with more than 8 years of schooling.
(6)-(7): Yanez ((1988); May of each year.
All the wage data have been deflated by the average corrected CPI based in INE, Yanez (1979) and Cortazar-Marshall (1979).
(8): Riveros (1988).

a relatively more pronounced wage decline for the skilled labor, while unskilled wages recovered in 1982 levels similar to 1970, a trend similar to that actually shown by the aggregate INE index. A major question with regard to those wage changes is their distributional impact across skill groups,

which in turn may reflect a different effect of macro policies across labor market segments.

The real minimum wage (MW) was relatively stable in 1976-80, but declined sharply during the post-crisis period. It is noteworthy that MWs grew significantly relative to both the equilibrium wage for unskilled labor in the informal sector and the average wage in the economy. Hence, MWs were probably important in affecting both average wages (Paldam & Riveros, 1987), and the level of employment of less skilled workers (Riveros & Paredes, 1988, 1989).[18]

Average real wages were growing in the presence of unemployment rates higher than the historical averages. Nonetheless, during the growing phase (1976-81), unemployment was declining, which would suggest an adequate, though probably slow, allocative work of the labor market. However, in interpreting observed wage growth in 1976-81, a binding role of the indexation mechanism implemented by the military government was suggested (Cortazar,1983). This is a very unlikely explanation at least for the period 1973-79, when a labor law was lacking, unions were banned, wage bargaining was suspended, job security norms were nonexistent and unemployment was relatively high. Possibly, a "neoclassical" model would be more suitable to explain observed wage trends in this period. On the contrary, in 1979-82, when the new labor law was enacted and included a wage indexation rule, the explanation of a binding indexation postulated by Cortazar is more acceptable. The wage indexation scheme prevailing in 1973-79 was deficient not only because of meager enforcement, but also because the past CPI inflation was normally higher than mandated

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18. The argument here is that MW increases, increased open unemployment and caused the withdrawal from the labor force of lowly-skilled people, particularly women and young job seekers.

adjustments (Edwards & Edwards, 1987) and the actual --corrected -- inflation was even higher than the official one (Cortazar,1983). Moreover, the mandated adjustments were not more than an "advice" for the private sector to follow public sector wage increases.

Analysis of wage indexation in 1976-81 is important in connection with its effect on other macroeconomic variables -- particularly inflation and the competitiveness of the domestic production -- and with regard to evaluating the actual role played by labor market forces in that period. We used quarterly INE data on wages -- which were also the ones used by Cortazar for the entire period 1974-81 -- to estimate a regression equation in which mandated wage increases (M) "explain" the actual change in average wages (W). Regression results reveal that in 1973-79 the presumed causality from mandated wage increases to average wage growth is debatable. As shown below (Table 5), the correlation between these variables is high, and the parameter associated to M reaches a value 1.0. However, when the quarterly inflation rate (P) is included, the effect of M on W does not have any interpretation: it has a negative sign. When the past rate of inflation (P-1) is included, the parameter associated to M is still significant, but its effect on average wages is relatively smaller than that of inflation.[19] In other words, the observed effect of mandated adjustments of an average wage seems to reflect no more than the effect of price inflation on wages.

The performance of wages in the Chilean economy during 1973-79 can be better explained by an economic model taking into account the existence of

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19. When we included lagged adjustments (M-1) and the actual inflation, both parameters were significant and the values were 0.70 and 0.26, respectively. Alternative lag structures were used with regard to both M and P.

Table 5
Chile: Wage Indexation Results 1973.3-1979.2

	Constant	M	P	P-1	R^2	DW
(1)*	4.57	1.0			0.72	1.74
	(1.12)	(7.0)			(51.2)	
(2)*	6.05	-0.60	1.37		0.97	1.98
	(4.20)	(-3.65)	(10.5)		(93.5)	
(3)*	0.21	0.40		0.65	0.88	2.15
	(0.78)	(3.0)		(5.75)	(71.7)	

The method of estimation was OLSQ. * indicates that correction for first order serial correlation was implemented.
The value of the t test is presented under the corresponding parameter. The value of the F test is presented under the R^2.

unemployment. A standard short run wage setting equation was adopted to test this hypothesis, in which nominal wage growth is explained by price inflation, unemployment (U) and the growth in average labor productivity (q). In estimating a regression model, we assume that only the cyclical portion of total unemployment (UC) is actually able to affect market wages (Lopez & Riveros, 1988).[20] We found a significant effect of both unemployment and inflation on observed wage changes in the period 1974.2-1979.2 (Table 6, row 1). In addition, when the variable M (mandated wage increases) was included in the equation, it produced a non-significant coefficient. This would suggest that wage setting in this period was driven by economic rather than institutional forces.

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20. The estimate of cyclical unemployment was obtained from a regression discussed in section 4, in which total unemployment is set as function of both structural and cyclical variables. This is version of the model proposed by Lopez & Riveros (1988) and applied by Riveros & Paredes (1989b).

Table 6
Chile: The Unemployment -Wages Trade-off.

Period	Constant	P	UC	q	R^2	DW
1974:2-79:2						
(1)*	24.1	0.98	-21.1	-0.02	0.97	1.5
	(3.98)	(24.6)	(-3.4)	(-0.32)	(220.3)	
1979:3-82:2						
(2)	9.1	0.23	-4.7	0.04	0.10	1.9
	(0.68)	(0.48)	(-0.4)	(0.14)	(2.92)	
(3)*	1.2	0.97 1/	-1.4	0.37	0.42	1.8
	(0.15)	(3.37)	(-0.2)	(1.61)	(4.41)	

The equations were estimated with OLSQ. * indicates that a correction for first-order serial correlation was performed. The t values are presented under the corresponding coefficients. The F value is presented under the R^2.
1/: the parameter correspond to the variables P-1.

Quite another story fits the period 1979.3-1982.2, when wage indexation was included in the new labor law enacted in 1979, which also gave rise to unionization and to formal wage negotiation. As seen in Table 6 (row 3), the effect of logged inflation is significant, but the overall fit is much poorer, while the parameters of unemployment is statistically equal to zero. This suggest that most likely the nominal wage behavior was dictated by institutional indexation rules

An important implication of this wage analysis refers to the importance of institutional labor market intervention polices. Wage indexation created substantial rigidities to accommodate production and employment to a changing external environment, because it was binding at a time that the exchange rate was nominally freezed. Thus, indexation caused a notable increase in wages in

terms of the price of tradables (Corbo, 1983).[21] In addition, indexation further segmented the labor market in a period of output and employment growth. If wrong signals had deteriorated employment growth in the years previous to 1979, in 1979-82 overvaluation and the blow on tradables production, were a further reason for persistent unemployment.

3.3 Distributive Results.

Income distribution deteriorated sharply as a result of the reform program of the 1970s. The social cost of the adjustment was associated with the creation of higher unemployment and to declining real wages (Riveros, 1985). The Gini coefficients for the family income distribution (Table 7) notably increased in 1974-76 to decline only slightly afterwards (between 1976 and 1979).[22] Strikingly, during the expansionary years 1979-81 -- amid a financial boom -- the observed income distribution further deteriorated (Table 7), this being consistent with the observed unemployment persistence and low wage levels still existing during that period. The decline seen in the Gini coefficients after 1984 is most likely related to the better performance of employment and wages with the export-led growth strategy.

Existence of fiscal social expenditures in the form of direct monetary subsidies to the poor, makes disputable estimates of Gini coefficients based on only labor incomes because they would be downward biased. However, in

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21. Data on dollar labor costs in Table 4 (Col.8), indicates the substantial increase associated to the period in discussion.

22. In Table 7 we include two alternative Gini coefficients for the family income distribution. To calculate the one in col (1), we ranked households by the total income of the household. To calculate the second one (col (2)) we ranked households by the per capita income of the household (Riveros & Weber, 1988). However, similar conclusions are reached in analyzing both coefficients.

1976-79 the need to control inflation and to tighten fiscal expenditures caused a severe decline in social outlays. After 1980, the observed increase (Col (4) Table 7) is associated with the privatization of the social security system, the emergency employment programs and to significant reforms in health and education which also permitted a better targeting of social outlays to the poor. Declining social outlays after 1985 are associated with fiscal restraint and to improvement in some labor market results. Thus, existence of lower fiscal social expenditures in combination with a better targeting of poor groups, do not provide a clear clue on the actual distributive trends during the adjustment.

3.4 Labor Market Aftermaths in the 1980s

Unemployment skyrocketed during the financial crisis, when the corrected rate reached as high as 30 percent of the labor force (Table 3). This result was basically demand-driven since participation rates did not substantially change with the recession. In addition, employment in tradable sectors dropped relative to total employment, an outcome likely associated to the increase in urban informal jobs. Furthermore, real wages declined substantially as unemployment was increasing, the index reaching a level of 93 after the level of 109 seen in 1981-82 (Table 4), which still was below the 1970 level.

As a result of the policy stance of 1984, total corrected unemployment fell importantly as employment grew by about 10 percent and emergency employment declined. Nevertheless, as the 1984 program was short-lived, real wages declined by more than 4 percent in 1985, at the time that the real exchange rate further depreciated (Column (9), Table 1). The unemployment

Table 7
Chile: Social Indicators

	Gini Coefficient (1)	Gini Coefficient (2)	Income Share of 40% Poorest	Fiscal Social Expenditure (% of GDP)	Per Capita GDP (1976 US$)
1960	0.4590	na.	13.59	na.	na.
1965	0.4750	na.	12.87	na.	na.
1968	0.4980	na.	11.70	na.	1.114
1970	0.5010	0.4345	11.50	na.	1.137
1972	0.4499	0.4232	na.	11.08	1.090
1975	0.4710	0.4127	12.78	10.30	0.933
1976	0.5380	0.4886	na.	9.99	0.950
1977	0.5260	0.4762	na.	10.56	1.026
1978	0.5197	0.4662	na.	10.16	1.091
1979	0.5179	na.	na.	9.25	1.162
1980	0.5257	na.	10.88	10.29	1.231
1981	0.5220	na.	11.24	12.80	1.277
1982	0.5390	na.	9.95	15.76	1.078
1983	0.5420	na.	10.07	15.10	1.052
1984	0.5550	0.5151	9.33	15.40	1.100
1985	0.5320	0.5011	10.13	15.12	1.108
1986	0.5390	0.4997	10.00	14.30	na.
1987	0.5310	0.4950.	10.22	13.97	na.

Notes: (1) Estimates based on total family income.
(2) Estimates based on per capita family income.

Sources: (1), (2)and (3): Riveros & Weber (1987); (4): Torche (1985) and unpublished data; (5): World Tables, The World Bank

rate experienced a steady decline since 1984, in a way apparently correlated with the recovery in GDP which was accompanied by expanding employment and production in tradable industries, and by a notable increase in non-traditional exports since 1985 (Table 2). In fact, employment in agriculture and manufacturing-mining grew at 6 and 11 percent per year respectively in 1985-88, when total employment grew at 6 percent per year. Even though the economy underwent a major adjustment program during 1985-87, output and employment grew importantly in agriculture and manufacturing as a result of

strong exports. At the same time, a more deregulated labor market, in which the institutional framework was clearly defined, and the maintenance of high real exchange rates allowed expansion of labor-intensive sectors.

4. A MODEL FOR ADJUSTMENT POLICIES AND LABOR MARKET RESPONSE

This section discusses and presents estimates of a model aimed at analyzing observed wages and unemployment in presence of labor market segmentation. In this model, segmentation is linked to the existence of protected and unprotected sectors with regard to the coverage of several labor market regulations. In considering that protected sectors usually consist of large urban firms and the public sector, the protected/unprotected breakdown significantly overlaps with the traditional formal/informal dichotomy. Given that the enforcement (and enforceability) of certain regulations may prompt asymmetrical wage effects across sectors, this approach to segmentation is appealing from an analytical viewpoint.

Existence of a growing protected/unprotected wage gap in a period of substantial macro adjustment may explain persistent unemployment. In fact, the existence of queueing unemployment -- in the form of informal sector workers queueing for formal sector jobs -- is likely to increase during the adjustment if the relative degree of labor protection in the formal sector increases. For instance, as suggested by the increase in minimum wages relative to wages of unskilled-informal labor during the period of reforms, the relatively larger protection awarded to formal sector workers may have not only resulted in more unemployment but also in unequitable effects in terms of wages in the unprotected sector.

In a neoclassical labor market, one would expect flexible wages in face of aggregate expenditure-reducing and expenditure-switching policies, This condition would imply declining wages in terms of the price of tradables that, in turn will produce labor shifts from the production of non-tradable to tradables. Rigid wages in a neoclassical labor market will result in lack of mobility, thus leading to standard policies aimed at removing wage distortions, but will not necessarily create systematic changes in wage differentials across certain labor force groups.

In a segmented labor market adjustment policies would exert an unequitable effect in terms of the observed protected/unprotected wage gap. In particular, nominal wages in the protected sector will be less responsive to a change in tradable prices, thus making a nominal devaluation less effective in achieving a real devaluation. This will hinder the inter-industrial labor mobility and increase total unemployment. In addition, the deterioration in income distribution in terms of wage gaps will affect the sustainability of adjustment programs. Thus, persistent unemployment, a deteriorating income situation of the poorest segment of the labor market, a decline in production of non-tradables (due to a drop in relative prices), lower employment in protected activities and implementation of repeated ineffective nominal devaluations are probable outcomes in a segmented market.

4.1 A Theoretical Model

The urban labor market is segmented into a protected (formal) sector characterized by government and union intervention in wage setting and by binding minimum wages, and an unprotected (informal) sector which is basically a neoclassical labor market. The formal sector produces both tradable and

non-tradable goods with skilled and unskilled labor, while the informal sector produces non-tradables with only unskilled labor.[23]

The (formal) market for skilled labor determines a notional equilibrium wage (ws*); the actual equilibrium wage (ws) includes a distortionary factor θ associated to government and union intervention. Thus, the actual nominal equilibrium wage is written as:

$$ws = \theta ws^* \qquad [1][24]$$

where $\theta > 1$. The minimum wage (MW) is binding for unskilled labor in the formal market and we assume some degree of substitution of skilled for unskilled labor. Thus, the formal sector demand for skilled labor (Lds) is written like:

$$Lds = Lds(ws, \theta, MW, PT, PN, K) + Lg \qquad [2]$$

where PT and PN are, respectively, prices of tradables and non-tradables, K is capital stock and Lg is public sector employment. This function is homogeneous degree one in prices and wages.

The labor supply of skilled workers (Lss) is:

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23. This model follows the basic lines presented in Lopez & Riveros (1987). Assumptions on the informal sector satisfy two important characteristics of this sector in LDCs (PREALC, 1985): it is a low productivity sector mainly concentrated in the services sector.

24. A more general specification of this relationship is explored in Lopez & Riveros (1989c).

$$Lss = Lss(ws, MW, CPI, N) \qquad [3]$$

where CPI is the consumer price index (in turn, an average of PT and PN), and N is working age population.

The formal sector demand for unskilled labor (Ldu) is:

$$Lduf = Lduf\ (MW, ws, PT, PN, K) \qquad [4]$$

which depends on ws because of the substitution possibilities between skilled and unskilled labor.

The total supply of unskilled labor (Lsu) in the economy is

$$Lsu = Lsu(MW, wu, CPI, N, K) \qquad [5]$$

where wu is the equilibrium wage in the informal sector. Finally, the informal sector labor demand is:

$$Ldu = Ldu(wu, PN, MW, K) \qquad [6]$$

Given MW and Lsu, employment of unskilled labor in the formal sector is determined through [4], thus leaving an effective supply to the informal sector which, in combination with Ldu, determines wu.[25]

For empirical purposes, the equilibrium form of the system will be considered. Thus, the system is reduced to two equilibrium wages equations.

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25. This type of equilibrium follows the concept introduced by Harberger (1971). Given that there will be persons with supply price above wu, but below the (given) MW, there will exist queueing (quasi-voluntary) unemployment.

This will allow to concentrate the analysis on the effect of policies on the formal-informal wage gap, thus circumventing estimation of the underlying structural demand and supply functions -- for which employment and labor force data are more scarce. Equilibrium in both the skilled (formal) market and the unskilled (informal) market yields the following expressions:

$$ws = ws(MW, PT, PN, K, Lg, N) \qquad [7]$$

$$wu = wu(MW, ws, PT, PN, K, N) \qquad [8]$$

Due to the homogeneity properties of the underlying demand and supply functions, [7] and [8] are homogeneous degree zero in prices and wages. Hence, for estimating purposes both equations will be written in terms fo MW.

Unemployment in this model results from two sources: labor market distortions (i.e., wages above notional equilibrium in the formal skilled market and queueing unemployment in the informal market) and cyclical fluctuations in the economic activity. Hence, a general formulation of an unemployment equation may allow to empirically derive both components based on aggregate data. In equation [9] both structural and cyclical factors are used to explain aggregate observed unemployment. Given their association with structural unemployment -- in turn due to the presence of labor market distortions -- the ratio MW/Wu and the value of the distortionary factor θ are included. The growth trend of the labor force (LFT)[26] is also included as a factor associated to the structural unemployment in the economy. Among the

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26. This variable is obtained by fitting actual labor force data to a time trend.

cyclical factors we consider unexpected changes in the following variables: GDP (Y), terms of trade (TOTS) and the labor force (LFS). Unexpected changes are empirically proxied through the difference between observed values and the fitted values obtained from a regression of the respective variables against a time trend. Thus, the following unemployment equation was estimated:

$$U = U(MW/Wu, \theta, LFT, Y, TOTS, LFS) \qquad [9]$$

Using [9], we estimate cyclical unemployment as the difference between U (total unemployment) and US (structural unemployment). US is calculated as the sum of the shift coefficient and the parameters associated to MW/Wu, θ, and LFT obtained from eq. [9], multiplied by the values of the corresponding variable. Thus, the third equation in the system corresponds to cyclical unemployment (UC) which is:

$$UC = UC(Y, PN, PT, ws, wu, Lg, K, N) \qquad [10]$$

Equation [10] results from specifying equilibrium wages in both the skilled and unskilled markets, and allowing for the presence of unemployment. This equation is homogeneous degree zero in income, prices and wages.

Prices of non-tradables are endogenously determined. However, to allow a better focus on the labor market issue, we do not include an equation for PN, but we will account for its endogeneity in estimating the structural system.[27] PT is determined using the small-country assumption, thus being

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[27]. Lopez & Riveros (1989) present a model in which prices of non-tradables are simultaneously estimated.

equal to the nominal exchange rate multiplied by the world price of tradables.

The model is closed with an investment equation which allows to connect the short run and the long run. Investment responds to a partial adjustment to a desired capital stock level, while the optimal capital stock depends on the interest rate, wages, prices and growth (Y). Hence, the following investment function is estimated:

$$I = I(i, Pt, Pn, wu, ws, MW, Y) \qquad [11]$$

Given the price and income homogeneity properties of the model,[28] we arbitrarily chose to normalize by the minimum wage. Equations [7], [8], [10] and [11] were estimated in rate of changes through 3SLS. The results are presented in Table 9 below.[29]

4.2 Empirical Results

As a preliminary step, and to obtain the parameters to subsequently compute the cyclical unemployment rate, we empirically estimated equation [9]. The 2SLS estimates presented below indicate that the distortionary factor MW/Wu is statistically significant to explain observed unemployment. This result suggests that queueing unemployment is an important component of the structural unemployment and, in turn, of total open unemployment. Labor force and terms of trade are also significant explanatory variables.

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28. The demand and supply functions are homogeneous degree zero in prices, wages and income. The wage equations are homogeneous degree one in prices. We also assume the investment and the unemployment functions are homogeneous degree zero in prices and income.

29. Appendix 1 indicate definition of the empirical variables and sources of information.

Using these econometric results, we decompose total unemployment into its structural and cyclical components. Results are presented in Figure 1. An interesting feature is that structural unemployment has been relatively high. After 1975, an increase in the average structural unemployment is observed but experiencing lower fluctuations afterwards. Cyclical unemployment was historically low, and at times negative, indicating excess of vacancies probably produced by skill mismatch. The relative importance of cyclical unemployment increased in the 1980s.

The econometric results for the system of four equations indicate satisfactory overall fits and right sign of the key coefficients. This suggests that a segmented labor market is an appropriate set up in analyzing the statistical information concerning wages, unemployment and macro policies.

In the case of the skilled wages equation, most parameters are significant using a 90 percent confidence interval. The effect of the distortionary factor θ appears prominent--thus suggesting the potential impact of exogenous intervention in raising effective market wages. The effect of changes in the price of tradable and non-tradable goods (PT and PN) indicates the positive response of formal sector nominal wages to inflation. This contrast with the negligible effect observed in the case of informal sector

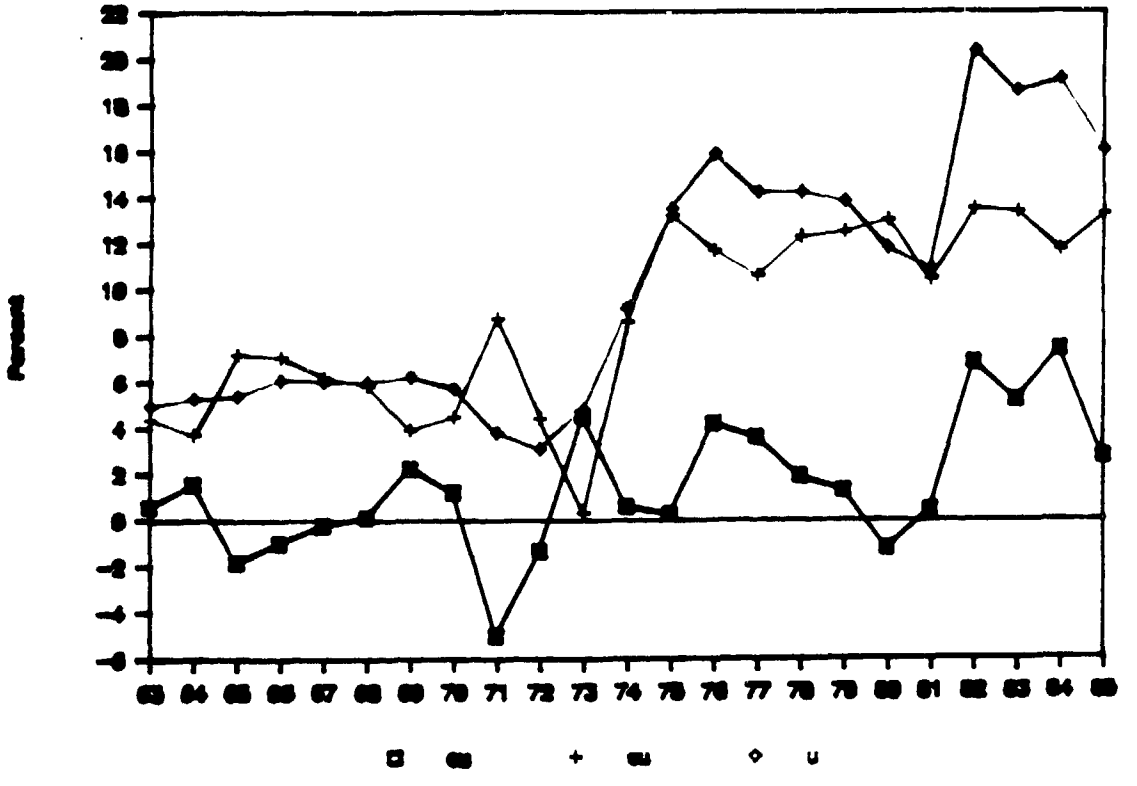
Table 8
Chile: Open Unemployment Equation
(Dependent Variable: Total Unemployment)

	θ	MW/Wu	LFT	Y*	TOTS	LFS
870.3	4.57	5.55	0.82	-0.16	0.58	0.09
(1.40)	(0.92)	(1.98)	(2.17	(-0.85)	(1.68)	(1.99)

R^2 =0.94 F= 27.7 DW 2.23

(Method = 2SLS. Instruments: government expenditures, working age pop. domestic credit and lagged values; Endogenous variables:MW/Wu and Y*). θ was proxied by the monetary value of non-wage labor costs. LFT is the fitted value of a labor force series regressed against time; LFS is the "shock" defined as the difference between the observed labor force and LFT. Y* is the output shock, which was obtained similarly to LFS. TOT is the structural trend in terms of trade, which is a fitted value against a time trend.

Figure 1
Chile: Components of the Total Unemployment



wages. This is particularly important with regard to PT, which reflects the direct effect of nominal devaluations. This finding suggests the extent of relative wage rigidity in the formal sector, which is at the root of an unequitable impact of exchange rate policies in presence of segmentation. This observed asymmetric effect cannot be easily explained in the context of an integrated labor market and suggests the need for appropriate corrective policies.

Income growth exerts a positive effect on growth of formal sector wages, as well as the pric of non-tradables, possibly due to the ability of unions to transform in wage gains most of the increases in market output prices. The growth in capital stock affect ws negatively, a possible explanation being that there prevails substitution of skilled workers for new capital. However, the parameter in this case is not statistically significant. Finally, the effect of public sector employment on ws is negative, which would indicate that the share of the public sector in the wage index is high, and that expansion in public sector employment takes places only at the cost of lower wages in terms of the minimum wage.

The wu equation indicates that growth of prices and formal sector wages are not relevant to explain change in equilibrium wages in the informal market. The factor relatively more important is income growth, which displays a highly significant elasticity. In comparing the coefficients obtained in both the ws and wu equations with respect to aggregate income, we conclude

Table 9
A Segmented Labor Market in the Adjustment
(3SLS Estimates; 1960-1985)

ws = 6.70 +0.99 (∅) +0.50 Yg +0.53 PTg +0.38 PNg -2.78 Kg -1.06 Lg
(1.66) (5.25) (1.34) (2.41) (1.41) (-1.15) (-3.72)
R^2 = 0.79 DW = 2.13
F = 11.2

wu =-11.4 +0.15 (∅) +2.00 Yg -0.94 PTg -0.004PNg +3.74 Kg -0.02 Lg -0.50ws
(-1.42) (0.54) (3.23) (-0.59) (-0.01) (1.56) (-0.07) (-1.10)
R^2 = 0.73 DW = 1.79
F = 8.74

UC =7.32 -1.75 Yg -0.92 PTg +0.52 PNg -0.79 Kg -0.51 Lg +0.38 LCg +0.67 wu
(1.39)(-3.38) (2.40) (1.81) (-1.52) (-1.68) (3.04) (1.99)
R^2 = 0.42 DW = 1.99
F = 2.55

Ig =-10.4 +0.27 PT/PN -0.02 ws-1 +0.22 wu-1 +0.30 M1g -0.34 M1D -0.11 YS-1
(-1.34)(1.32) (-0.04) (0.06) (3.53) (-3.68) (-2.59)
R^2 = 0.52 DW = 1.82
F = 5.12

All variables are defined in growth rates (relative to minimum wages)

ws = wage of skilled workers	Yg= Aggregate Expenditures
wu = wages of unskilled workers	Kg= Capital Stock
(0)= non-wage costs of labor	Lg= Public Sector Employment
PTg= Price deflator of tradable goods	M1g= M1
PNg= Price deflator of non-tradable goods	M1D= Dummy (1=1960-73)
LCg= Total labor costs (ws +(0))	Ig=Investment
ws-1= Lagged (1 year) ws	UC=Cyclical Unemployment
wu-1= Lagged (1 year) wu	YS-1=Lagged Income shock

Instruments: Public Expenditures, working age population, lagged values.

that contractionary policies would affect unskilled labor in the informal sector relatively more than labor in formal activities. These results are in line with those found by Lopez & Riveros (1989) in a comparative study covering four countries.[30]

[30]. In both wage equations we included the rate of growth of the labor force, but results were not significant. We tested for structural differences in the equations for the periods 1960-73 and 1976-1981, but we did not find

In the case of the cyclical unemployment equation, results indicate that expenditure growth as well as the expansion in public sector employment and the growth in the capital stock negatively affect unemployment. A positive impact derives from both tradable prices and wages; moreover, when the regression was performed with the ratio PT/PN (i.e., the real exchange rate), the parameter was significant and positive, indicating that switching policies create more cyclical unemployment likely due to both rigidities in moving labor across sectors and higher wage rigidity in the formal sector.

The investment equation reveals a very significant impact of the growth in M1, a variable we included as a proxy for the real interest rate.[31] Furthermore, a dummy variable on this coefficient (M1D= 1 for the period 1960-73) resulted significant and negative, thus implying that during that period the role of the interest rate on aggregate investment was probably very low or zero. The other variable that affect investment in an important way is the lagged income shocks -- defined as the residual obtained by the difference between observed aggregate income and a fitted time trend. The relative price of tradables to non-tradables is positive and significant at 90 percent. However wages do not appear to affect investment growth, as well as output prices when included separately.

A devaluation increases the formal/informal wage gap in Chile. A similar result is associated with an output decline. An implication is that due to the prevailing labor market structure, typical adjustment policies exert a negative equity impact. This evidence also indicates that adjustment

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evidence in support of the idea of a different distribution of the data.

[31]. Due to control of the interest rate during most of the 1960s and early 1970s, this variable is not reliable to measure the opportunity cost of capital. We also use the investment deflator, but the result did not came out significant.

policies increase cyclical unemployment. Likewise, contractive policies negatively affect investment and a real devaluation seems to encourage it, but labor market variables do not directly play a role. However, if labor market segmentation makes a nominal devaluation more ineffective in reaching a real devaluation -- in the case of prices of non-tradables highly responsive to the increase in formal sector wages[32] -- the labor market would play an important role. In sum, the presence of labor market segmentation would help to make unemployment more persistent and the adjustment more unequitable.

5. Summary and Conclusions

In this paper we have analyzed the key role of the labor market in the adjustment of the Chilean economy in the 1980s. In order to explain the performance of the labor market during the structural adjustment of the 1980s consideration of the deteriorated situation in terms of unemployment and wages in the late 1970s was deemed necessary. The impact on labor market variables of a series of structural reforms aimed at reducing the economic size of the State, deregulating product and factor markets and opening the economy to foreign trade were of paramount importance in the 1970s. Moreover, the absence of labor laws and the use of the exchange rate as an stabilization device, gave signals prompting lower employment growth, higher growth of non-tradables, decreasing savings and increasing external indebtedness.

After 1984 the Chilean economy underwent a major macro adjustment, whose success was partly expedited by the deep reforms carried out in the 1970s. The post-crisis policy was characterized by the achievement of significant

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32. Lopez & Riveros (1989) have measured this effect, and calculated the elasticity displayed by PN with respect to prevailing labor market distortions.

real devaluations, further privatization, targeting of social expenditures to the poor, export promotion and financial policies to deal with the external debt and to increase investment. The results in terms of the labor market were a dramatic decline in open unemployment a slight increase in real wages and significant growth of employment in tradables.

A review of the stylized facts of the Chilean labor market provides support to a model of labor market segmentation in which crucial variables are associated with the degree of protection awarded to formal sector workers. Econometric analysis indicated that expenditure-switching and expenditure-reduction policies reduce real informal sector wages relative to formal sector wages, thus negatively affecting income distribution in periods of adjustment. Relative wage rigidity in formal sector and the increase in the formal-informal wage gap hinder labor mobility and affect the effectiveness of nominal devaluations. In turn, the increase in the formal-informal wage gap yield an increase in unemployment. The persistence of open unemployment may thus be associated to the prevailing labor market structure, which is also at the root of a slower adjustment to macro policies.

There are three important implications that can be extracted from this case study. First, macroeconomic adjustment should be accompanied by deregulation of the labor market to minimize the adverse and unequitable effects stemming from expenditure-reduction and expenditure-switching policies. This essentially implies that wage indexation and other policies aimed at protecting formal sector incomes should be carefully examined. Second, the role of skills is important in connecting structure of the labor market and its response to macroeconomic policies, thus revealing the importance of including skill enhancement within structural adjustment

policies. This implies that the increase in labor mobility may be achieved not only through legal and institutional reforms, but also through provision of skills to informal sector workers. Third, that high open unemployment is strongly linked to queueing for formal sector jobs, which is in turn derived from distorted wages. In periods of transition, total unemployment will be not only linked to observed productive shifts in production, but also to a higher queueing unemployment due to relatively greater wage distortions. This suggests that policies aimed at dealing with unemployment must lend attention to the regulatory framework existing in formal labor markets.

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